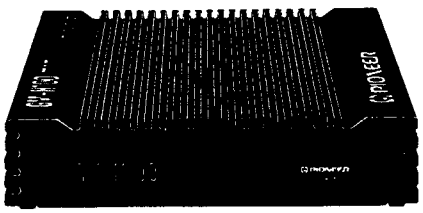
PIONEER®
*The Art of Entertainment*

# *Service Manual*

● GM-H100/UC



ORDER NO.
**CRT1343**

BRIDGEABLE POWER AMPLIFIER

# GM-H100 UC
# GM-H50 UC

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# SAFETY INFORMATION

## CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

## WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

# SPECIFICATIONS

Power source ..... 14.4 V DC (10.8 - 15.6 V allowable)
Grounding system ..... Negative type
Current consumption
(GM-H100) ..... 13 A (at continuous power, 4Ω)
(GM-H50) ..... 6.5 A (at continuous power, 4Ω)
Fuse
(GM-H100) ..... 30 A
(GM-H50) ..... 15 A
Dimensions
(GM-H100) ..... 264 (W) × 58 (H) × 260 (D) mm
[10 - 3/8 (W) × 2 - 1/4 (H) × 10 - 1/4 (D) in.]
(GM-H50) ..... 264 (W) × 52 (H) × 181 (D) mm
[10 - 3/8 (W) × 2 (H) × 7 - 1/8 (D) in.]
Weight
(GM-H100) ..... 4.3 kg (9.5 lbs.)(Leads for wiring not included)
(GM-H50) ..... 2.9 kg (6.4 lbs.)(Leads for wiring not included)
Maximum power output
(GM-H100) ..... 100 W × 2/320 W × 1 (EIAJ)
(GM-H50) ..... 50 W × 2/160 W × 1 (EIAJ)
Continuous power output
(GM-H100) ..... 50 W × 2/160 W × 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD)
80 W × 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
(GM-H50) ..... 25 W × 2/80 W × 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD)
40 W × 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance ..... 4Ω (2 - 8Ω allowable)
Frequency response ..... 10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio ..... 100 dB (IHF - A network)
Distortion
(GM-H100) ..... 0.003% (at 20 W, 1 kHz)
(GM-H50) ..... 0.003% (at 10 W, 1 kHz)
Separation ..... 65 dB (1 kHz)
Input level ..... 0.2 - 2 V /8 kΩ

*These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.*

**Note:**
Specifications and the design are subject to possible modification without notice due to improvements.

# 1. DISASSEMBLY

## • Remove the Case

1. Remove the four screws A and remove the case.

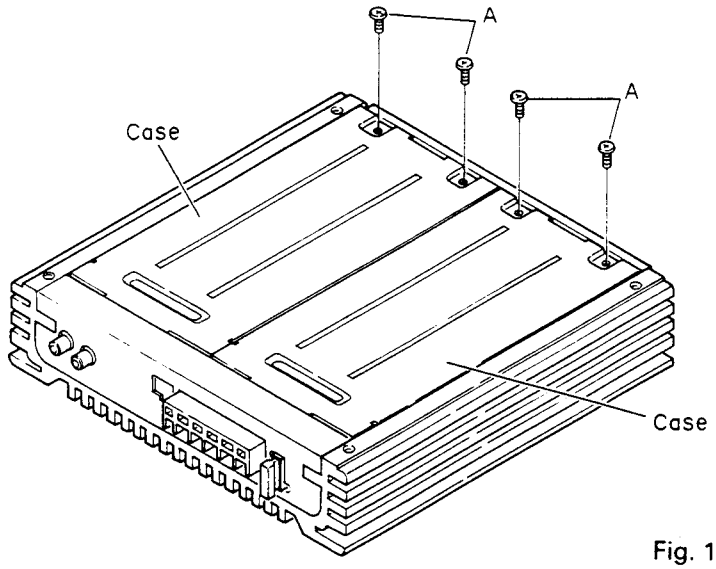



Fig. 1

## • Remove the Heat Sink

1. Remove the two screws B and remove the front panel.
2. Remove the two screws C and remove the rear panel.
3. Remove the ten screws D and remove the heat sink.

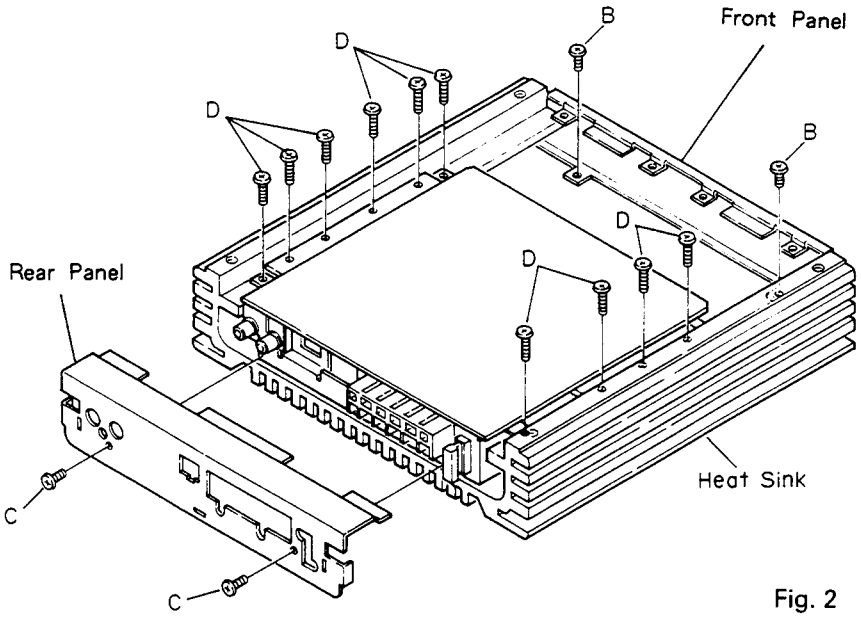



Fig. 2

# 2. CIRCUIT DESCRIPTION

## ● PWM (Pulse Width Modulation) POWER SUPPLY

The PWM power supply is a circuit that maintains stable secondary voltage in a DC-DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.
Former PWM power supply detected and controlled only positive voltage of DC-DC converter. New PWM power supply increases output in the lower range through detecting and controlling both positive and negative voltages and it creates a higher fidelity sound.

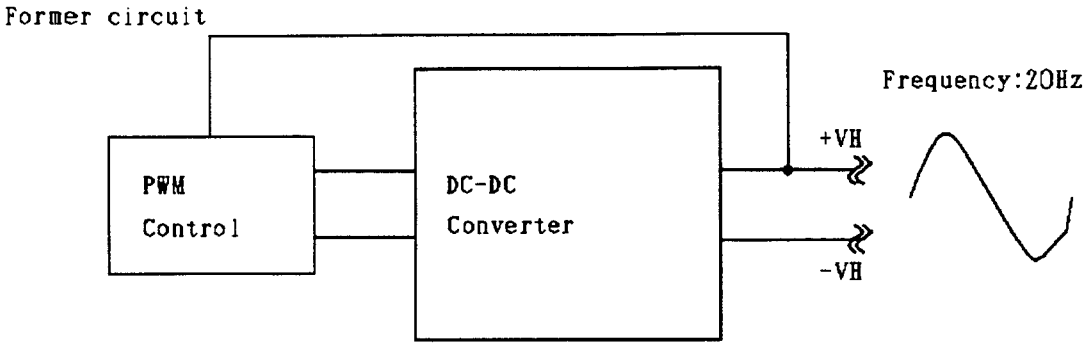



Fig. 3

Former circuit did not detect negative voltage and it created distortions at the lower part as output increases.

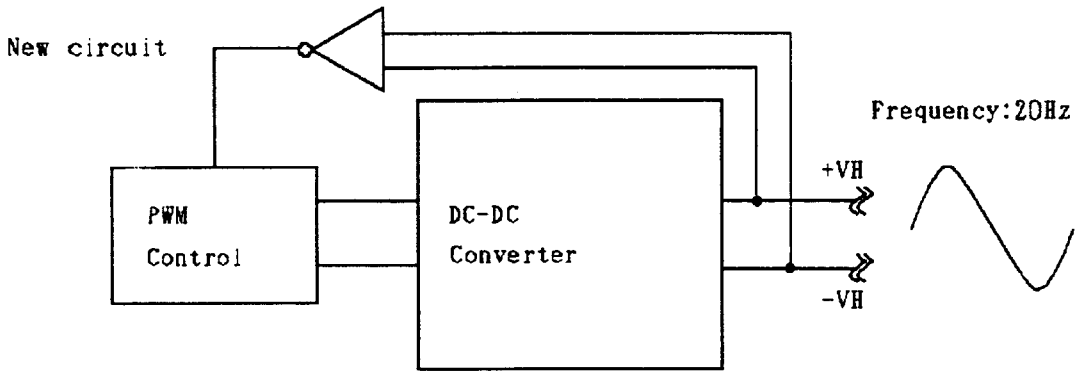



Fig. 4

New circuit detects both positive and negative voltage and it dose not create any distortions at the lower part even when output increases.

# 3. ADJUSTMENT

## • Connection Diagram

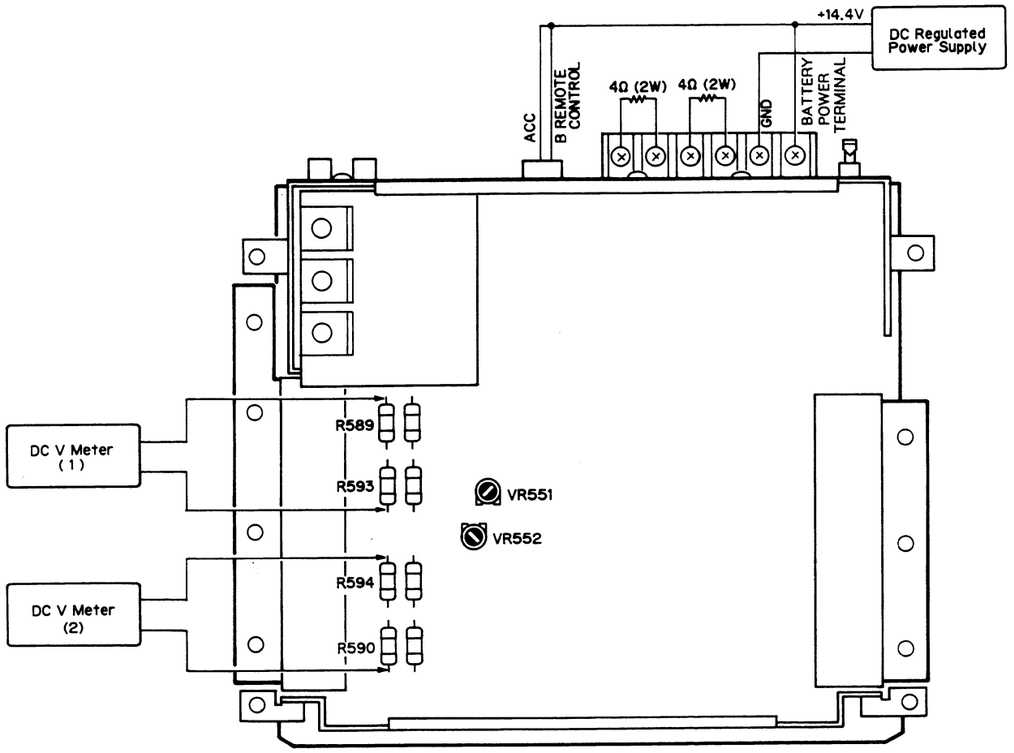



Fig. 5

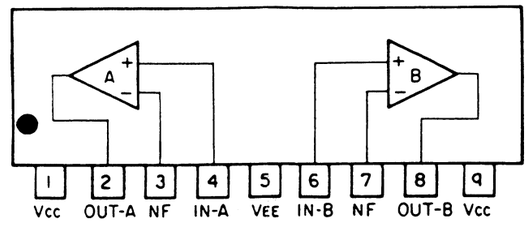
## 3.1 IDLE CURRENT ADJUSTMENT

| No. | Adjusting Point | Adjustment Method |
|---|---|---|
| 1 | | Rotate VR551 and VR552 counterclockwise.<br>Turn the power on, and wait about 10 minutes. |
| 2 | VR551, 552 | DC V Meter: 1.0mV+ 2.3mV<br>- 0.34mV |

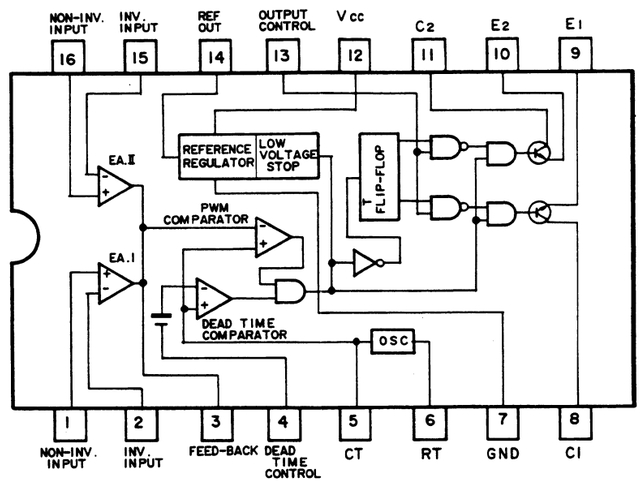


## • ICs

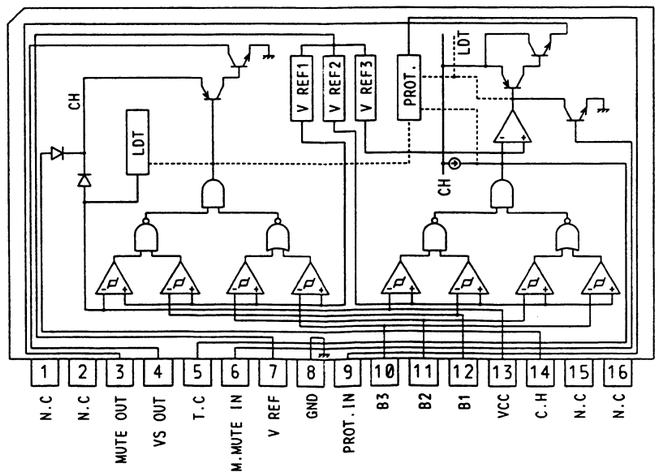
UPC4570HA



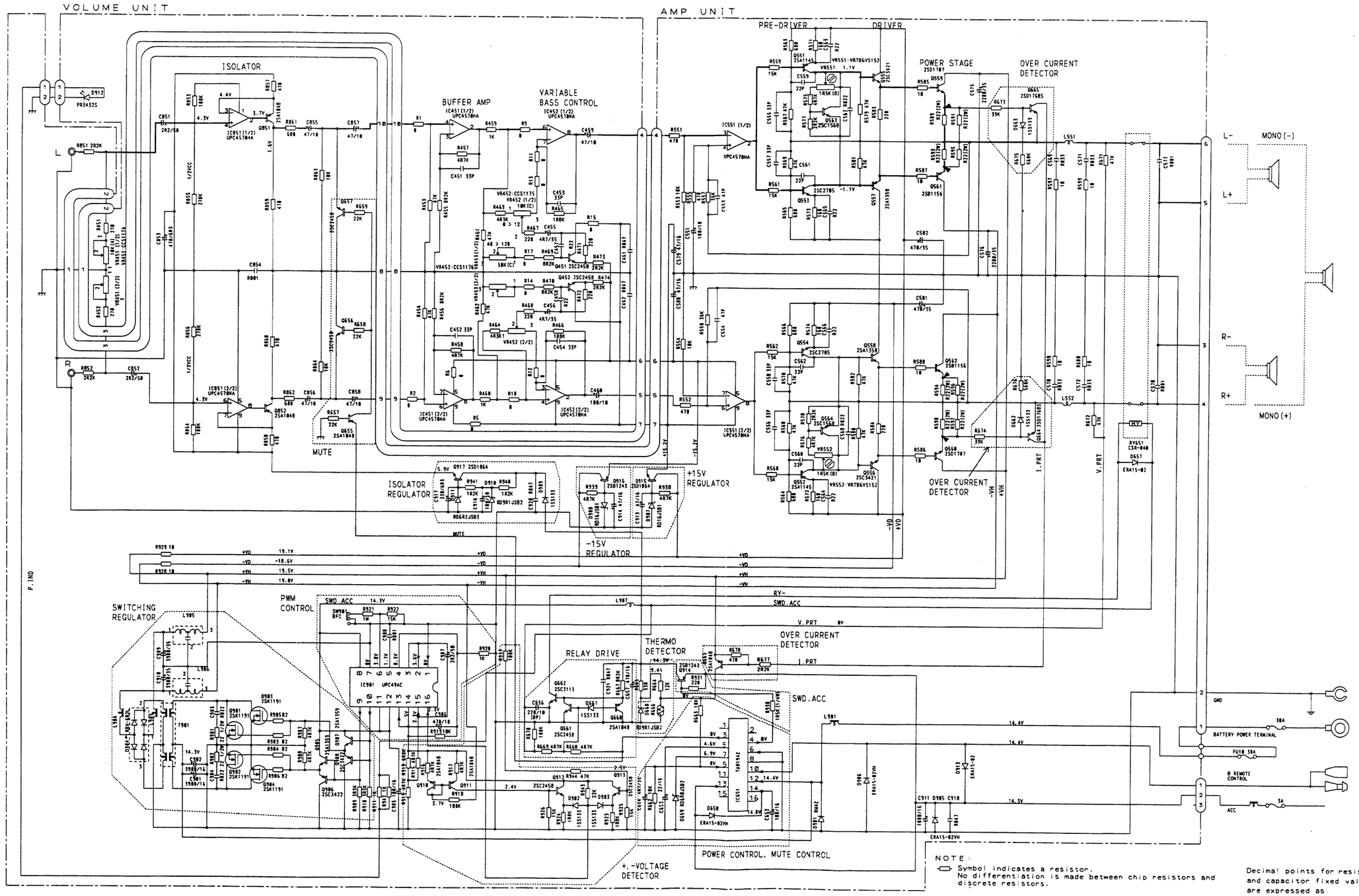

UPC494C




TA8194Z



# 4. SCHEMATIC CIRCUIT DIAGRAM (GM-H100/UC)




NOTE:

⊣⊢ Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

⊣⊢ Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCH:
AMP UNIT
SW901:BFC SWITCH ..... LOW-HIGH

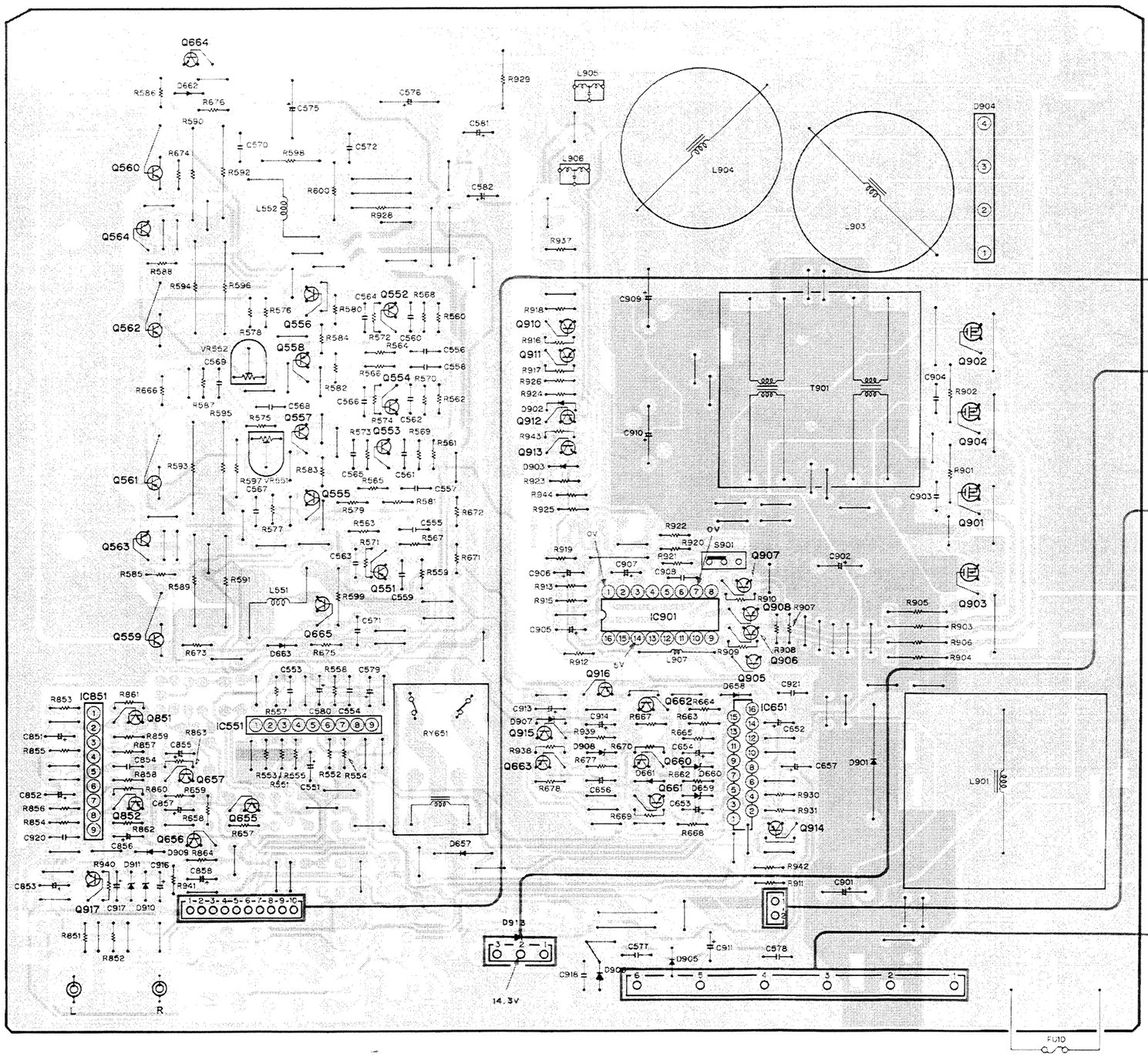
The underlined indicates the switch position.

Fig. 6

# 5. CONNECTION DIAGRAM (GM-H100/UC)

**AMP UNIT**

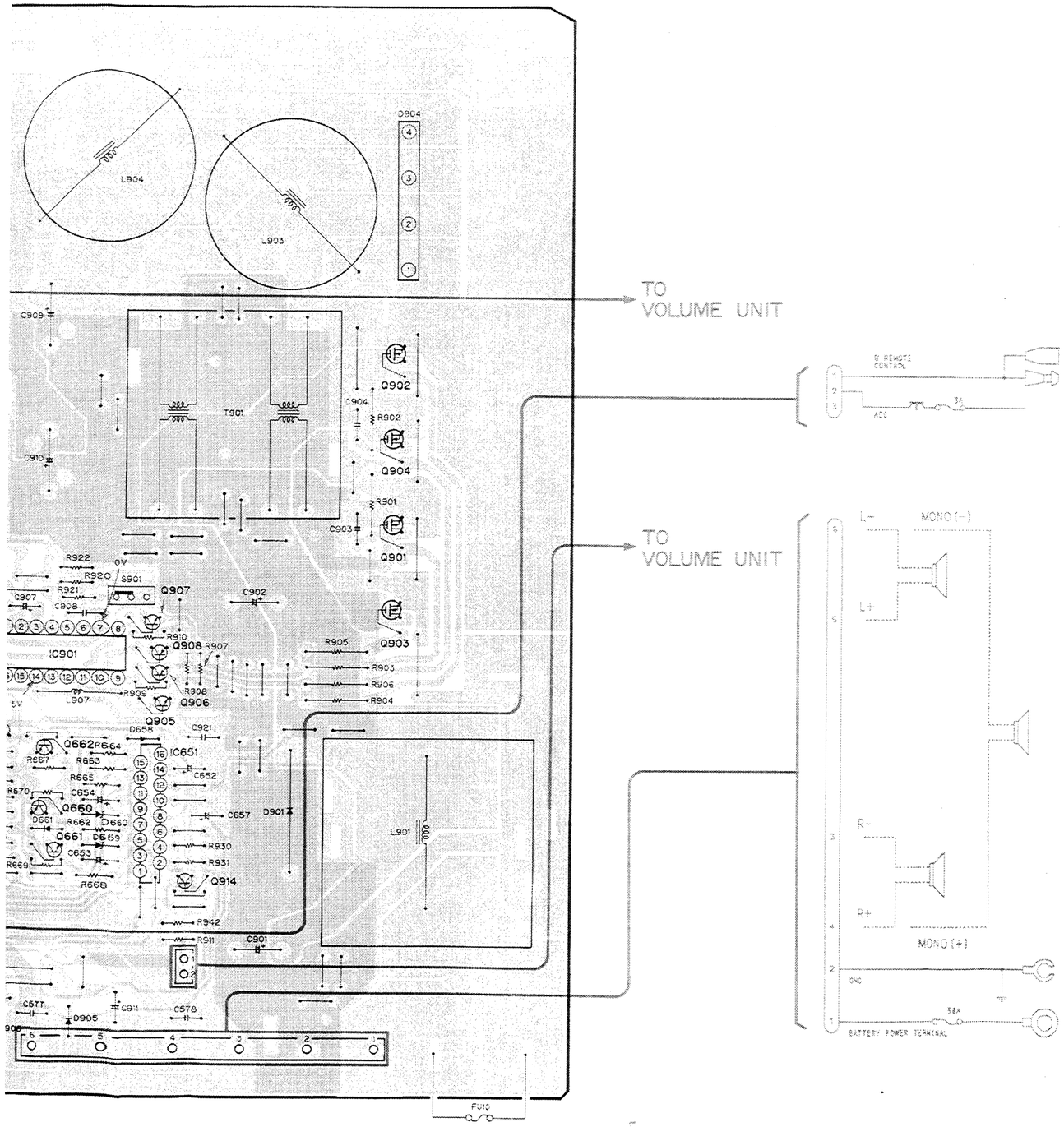
| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IC, Q | Q564 Q560 Q562 Q664 Q563 Q851 Q561 Q657 Q917 IC851 Q852 Q559 Q656 | | | | Q655 | IC551 Q665 Q558 Q555 Q557 Q556 | | | Q553 Q552 Q551 Q554 | | | | Q911 Q910 Q661 Q915 Q912 IC901 Q660 Q663 Q913 Q916 Q662 | | | | Q907 Q914 Q905 Q908 IC651 Q906 | | | | Q902 Q904 Q903 Q901 | | |
| ADJ | | | | | | VR552 VR551 | | | | | | | | | | | | | | | | | |



Q661
Q901 Q660
Q916 Q662

Q907 Q914
Q905 Q908
IC651 Q906

Q902 Q904
Q903 Q901




## VOLUME UNIT

IC. Q IC451 Q452 IC452 Q451

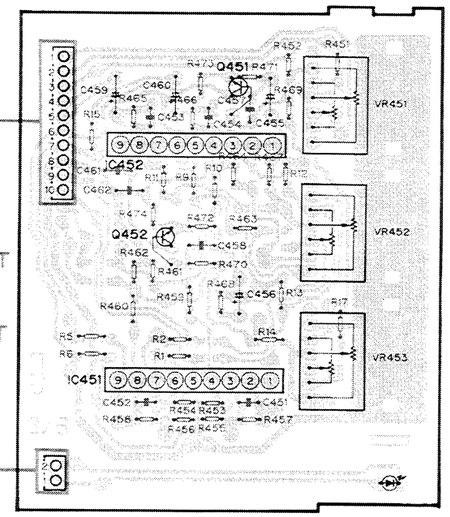


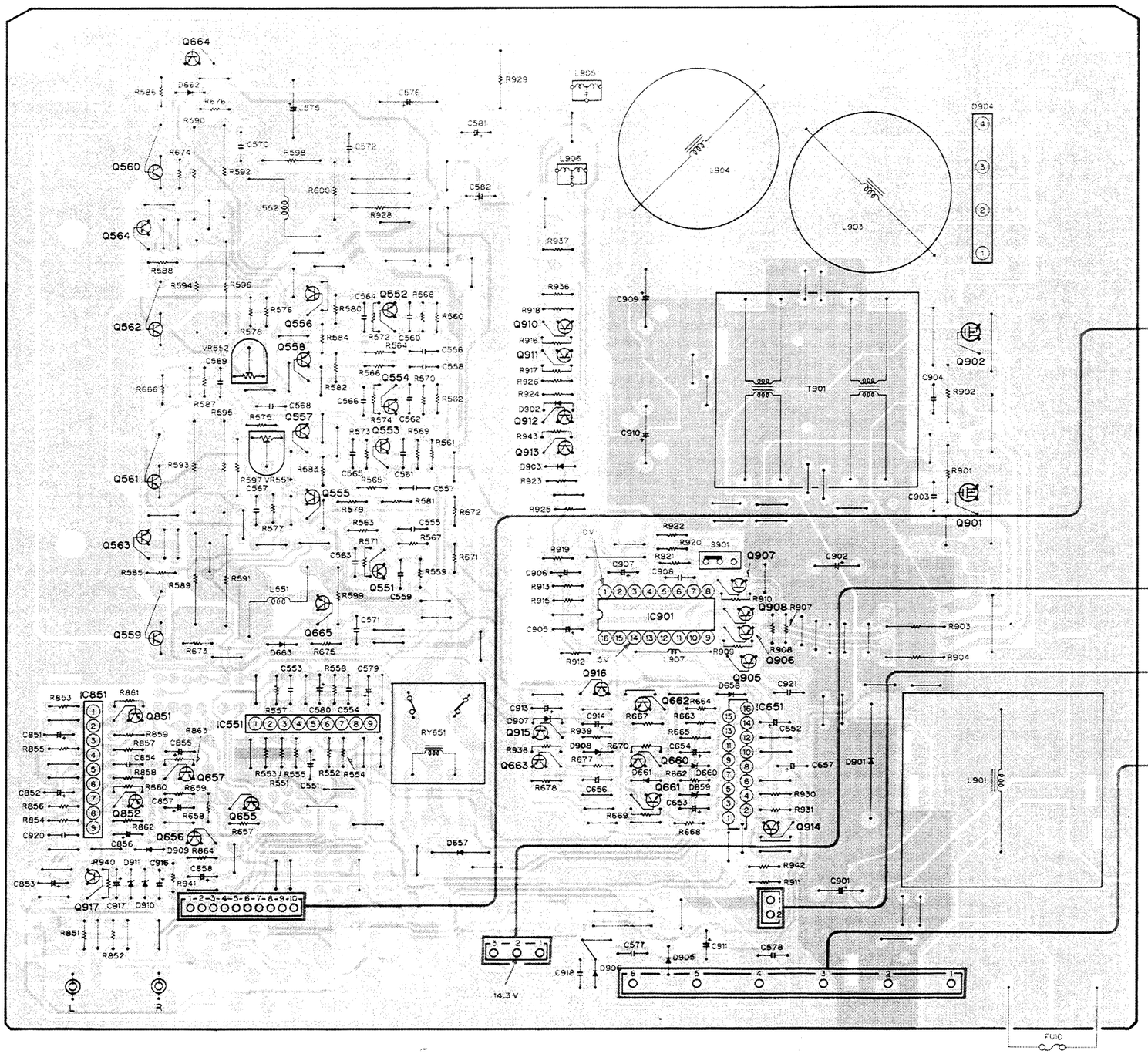

Fig. 7

# 6. CONNECTION DIAGRAM (GM-H50/UC)

## AMP UNIT

IC, Q: Q564 Q560 Q562 Q664 / Q563 Q851 Q561 Q657 / Q917 IC851 Q852 Q559 Q656 Q655 / IC551 Q665 / Q558 Q555 / Q557 Q556 / Q553 Q552 / Q551 Q554 / Q911 Q910 Q661 / Q915 Q912 IC901 Q660 / Q663 Q913 Q916 Q662 / Q907 Q914 / Q905 Q908 / IC651 Q906 / Q902 / Q901

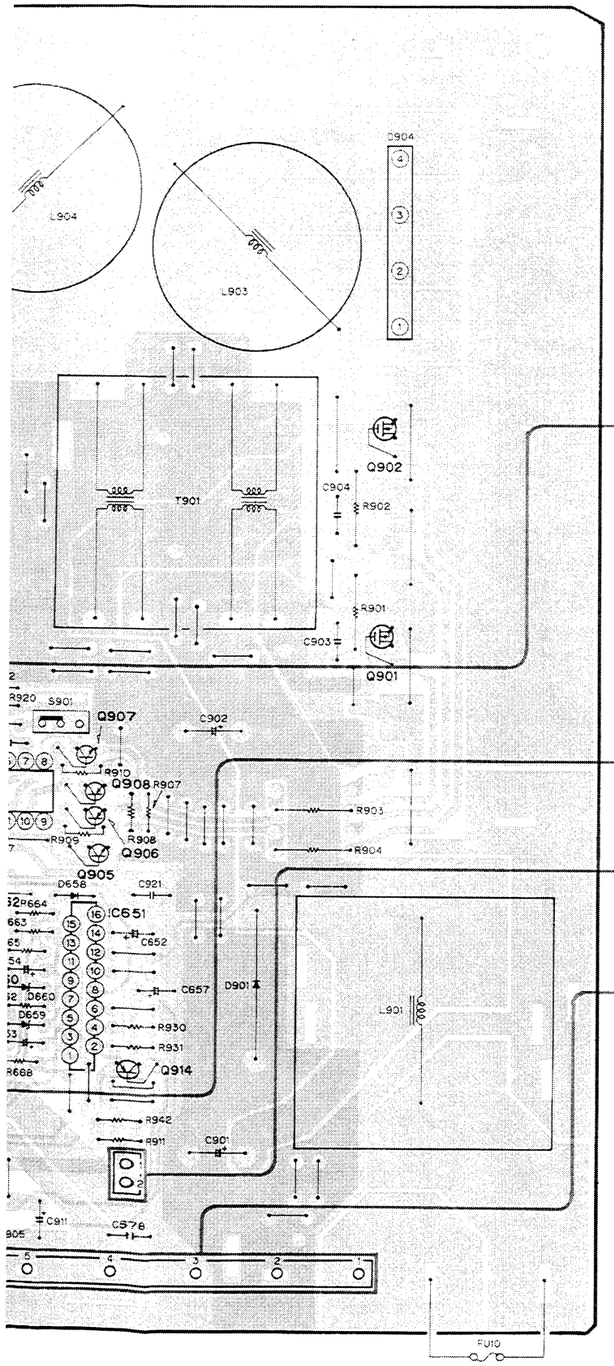
ADJ: VR552 VR551



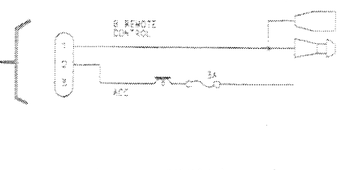
Q907 Q914
Q905 Q908
IC651 Q906

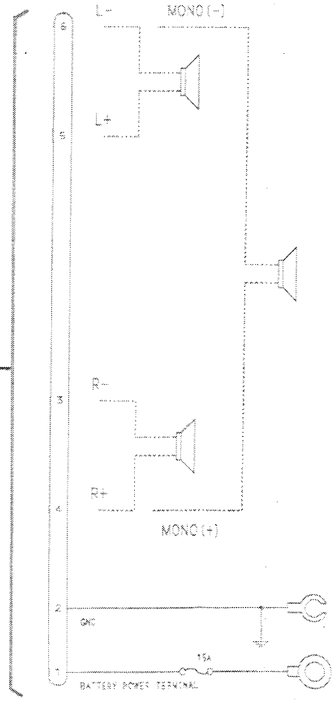
Q902

Q901




TO
VOLUME UNIT

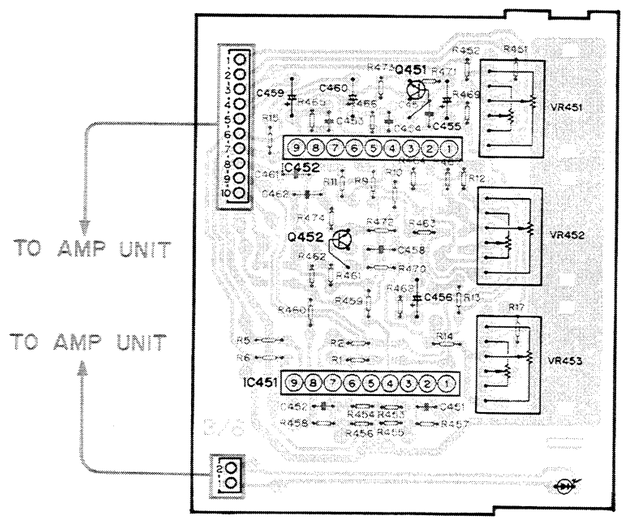



TO
VOLUME UNIT

**VOLUME UNIT**

IC. Q IC451 Q452 IC452 Q451

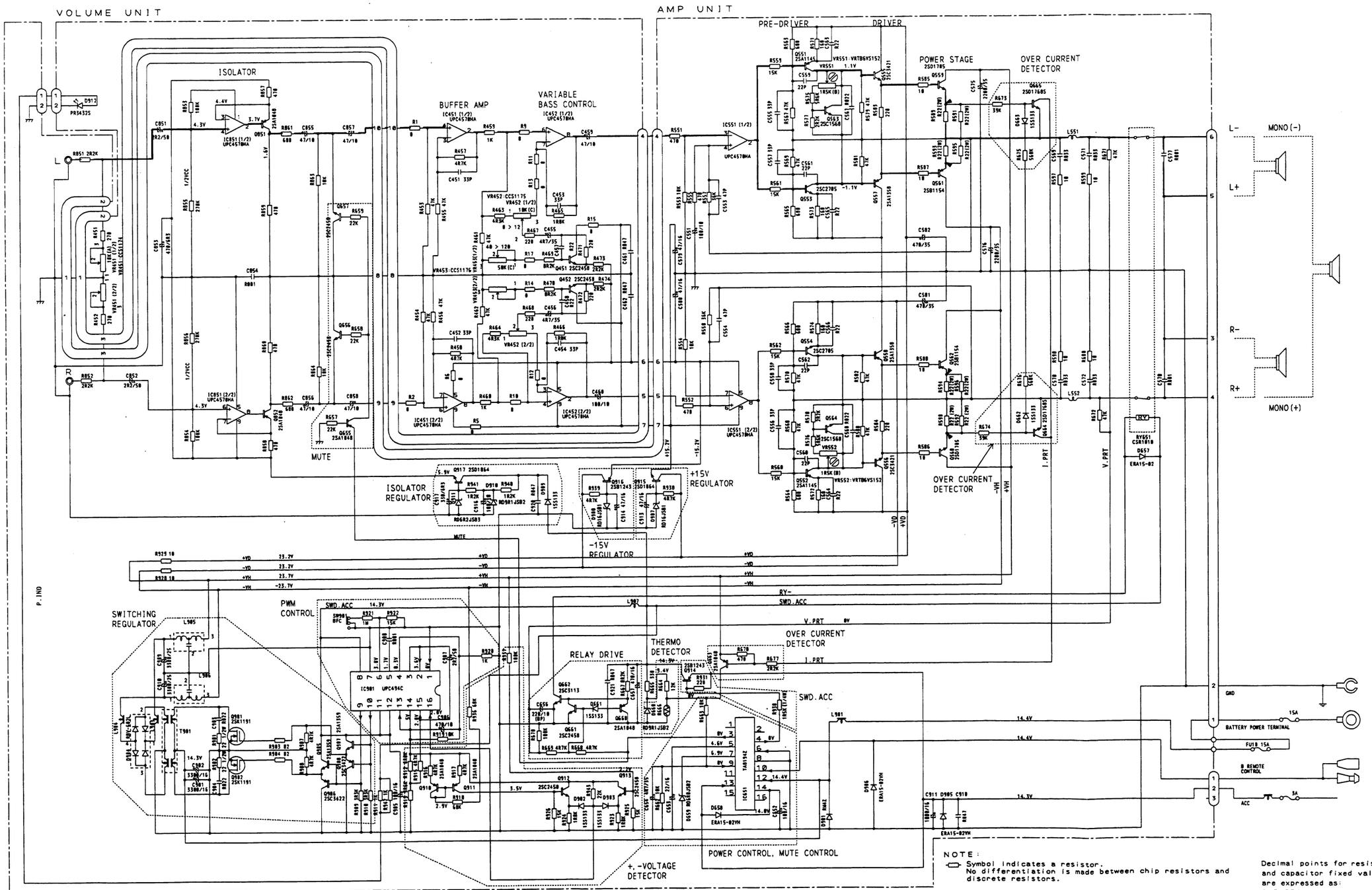



TO AMP UNIT

TO AMP UNIT

Fig. 8

# 7. SCHEMATIC CIRCUIT DIAGRAM (GM-H50/UC)




NOTE:

- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCH:
AMP UNIT
SW901: BFC SWITCH..... LOW-HIGH

The underlined indicates the switch position.

Fig. 9

## 8. EXPLODED VIEW

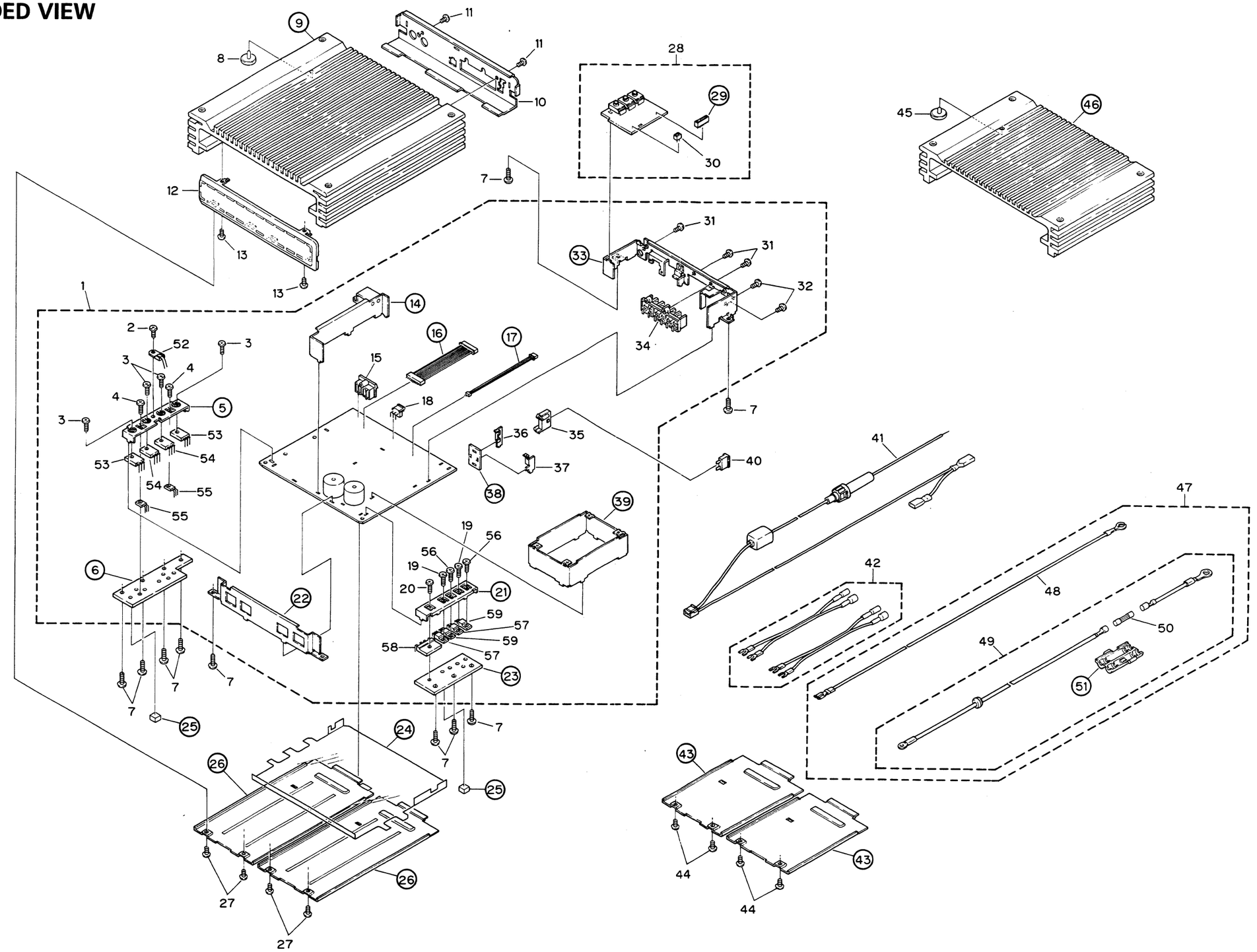



Fig. 10

## ● Parts List

*NOTE:*
- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

| Mark | No. | Description | Part No. |
|---|---|---|---|
| ◉ | 1 | Amp Unit (H100) | CWH1101 |
| | | (H50) | CWH1103 |
| | 2 | Screw | BMZ30P050FMC |
| | 3 | Screw | BMZ30P100FMC |
| | 4 | Screw | BMZ30P100FZK |
| | 5 | Bracket | |
| | 6 | Heat Sink (H100) | |
| | | (H50) | |
| | 7 | Screw | BMZ30P100FMC |
| | 8 | Lens (H100) | CNS2050 |
| | 9 | Heat Sink (H100) | |
| | 10 | Panel (H100) | CNB1391 |
| | | (H50) | CNB1397 |
| | 11 | Screw | PMS30P040FZK |
| | 12 | Panel (H100) | CNB1390 |
| | | (H50) | CNB1394 |
| | 13 | Screw | BMZ30P040FMC |
| | 14 | Holder | |
| | 15 | Jack | CKB1006 |
| | 16 | Connector | |
| | 17 | Connector | |
| | 18 | Plug | CKS1821 |
| | 19 | Screw | BMZ30P080FMC |
| | 20 | Screw | BMZ30P080FMC |
| | 21 | Bracket | |
| | 22 | Holder | |
| | 23 | Heat Sink | |
| | 24 | Insulator | |
| | 25 | Spacer (H100) | |
| | 26 | Case (H100) | |
| | 27 | Screw (H100) | BMZ30P040FMC |
| ◉ | 28 | Volume Unit (H100) | CWG1024 |
| | | (H50) | CWG1026 |
| | 29 | Plug | |
| | 30 | Plug | CKS1035 |
| | 31 | Screw | PPZ30P080FZK |
| | 32 | Screw | PPZ20P080FZK |
| | 33 | Bracket | |
| | 34 | Terminal (H100) | CKE1016 |
| | | (H50) | CKE1017 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 35 | Fuse Holder | CKR1001 |
| | 36 | Terminal | CNC3549 |
| | 37 | Terminal | CNC3548 |
| | 38 | P. C. Board | |
| | 39 | Holder | |
| | 40 | Fuse (H100) | CEK1140 |
| | | (H50) | CEK1137 |
| | 41 | Cord Assy (H100) | CDE3309 |
| | | (H50) | CDE3016 |
| | 42 | Cord Assy (H100) | CDE3307 |
| | | (H50) | CDE3018 |
| | 43 | Case (H50) | |
| | 44 | Screw (H50) | BMZ30P040FMC |
| | 45 | Lens (H50) | CNS2053 |
| | 46 | Heat Sink (H50) | |
| | 47 | Cord Assy (H100) | CDE3164 |
| | | (H50) | CDE3030 |
| | 48 | Cord (H100) | CDE3025 |
| | | (H50) | CDE3020 |
| | 49 | Cord (H100) | CDE3163 |
| | | (H50) | CDE3024 |
| | 50 | Fuse (H100) | CEK1117 |
| | | (H50) | CEK1115 |
| | 51 | Fuse Holder | |
| | 52 | Thermister (H100) | CCX1009 |
| | | (H50) | CCX1010 |
| | 53 | Transistor (H100) | 2SD1707 |
| | | (H50) | 2SD1705 |
| | 54 | Transistor (H100) | 2SB1156 |
| | | (H50) | 2SB1154 |
| | 55 | Transistor | 2SC1568 |
| | 56 | Screw (H100) | BMZ30P080FMC |
| | 57 | FET | 2SK1191 |
| | 58 | Diode | RBV-602L |
| | 59 | FET (H100) | 2SK1191 |

# 9. PACKING METHOD

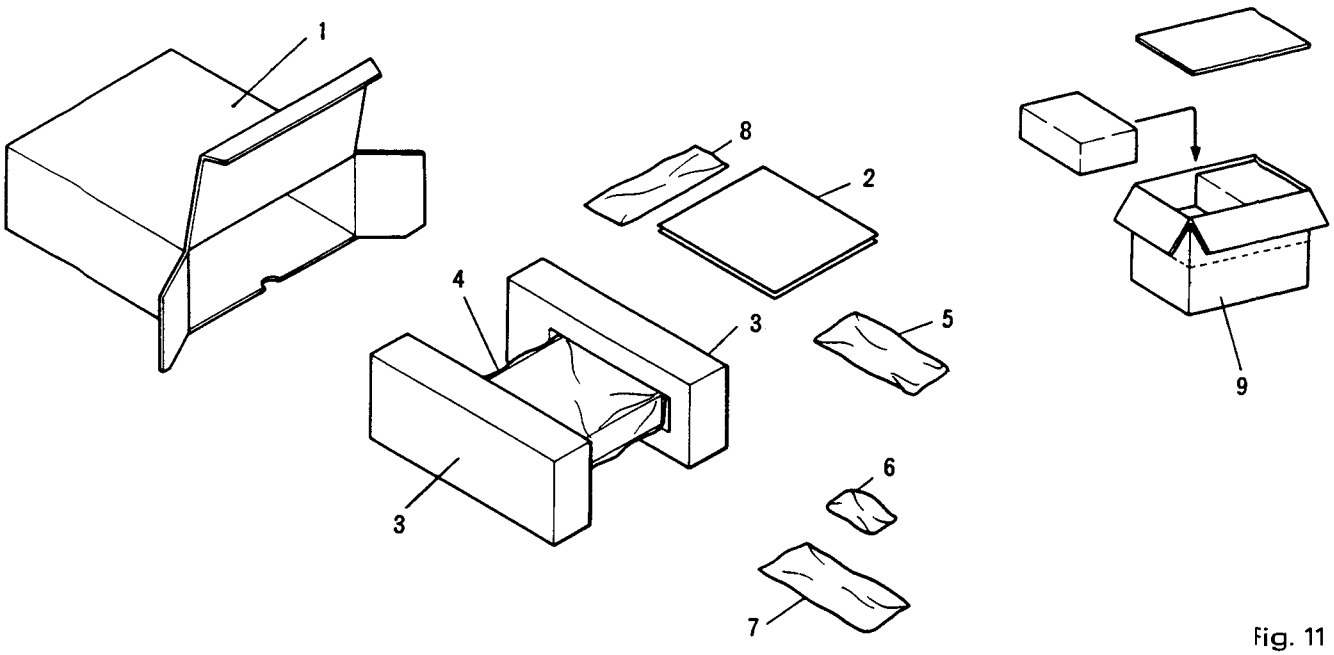



Fig. 11

## ● Parts List

| Mark No. | Description | Part No. |
|---|---|---|
| 1 | Carton (H100) | CHG1908 |
| | Carton (H50) | CHG1907 |
| 2-1 | Owner's Manual (English, French) | CRD1430 |
| 2-2 | Card | |
| 3 | Styrofoam (H100) | CHP1380 |
| | Styrofoam (H50) | CHP1379 |
| 4 | Polyethylene Bag (H100) | CEG1026 |
| | Polyethylene Bag (H50) | CEG1042 |
| 5 | Cord Assy (H100) | CDE3309 |
| | (H50) | CDE3016 |
| 6 | Cord Assy (H100) | CDE3307 |
| | Cord Assy (H50) | CDE3018 |
| 7 | Cord Assy (H100) | CDE3164 |
| | Cord Assy (H50) | CDE3030 |

| Mark No. | Description | Part No. |
|---|---|---|
| 7-1 | Cord (H100) | CDE3025 |
| | Cord (H50) | CDE3020 |
| 7-2 | Cord (H100) | CDE3163 |
| | Cord (H50) | CDE3024 |
| 8-1 | Screw Assy | |
| 8-1-1 | Screw (× 4) | HYC50P650FZK |
| 8-2 | ····· | |
| 8-3 | Cover | CNS2052 |
| 8-4 | Driver | CNV2697 |
| 9 | Contain Box (H100) | CHL1908 |
| | Contain Box (H50) | CHL1907 |

# 10. ELECTRICAL PARTS LIST

*NOTE:*

- *Parts whose parts numbers are omitted are subject to being not supplied.*
- *The part numbers shown below indicate chip components.*

*Chip Resistor*

*RS1/8S □□□J, RS1/10S □□□J*

*Chip Capacitor (except for CQS.....)*

*CKS....., CCS....., CSZS.....*

## ● GM-H100/UC

Unit Number :
Unit Name : Volume Unit

MISCELLANEOUS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| IC | 451 452 | | UPC4570HA |
| Q | 451 452 | | 2SC2458 |
| D | 912 | | PR3432S |
| VR | 451 | Volume 10kΩ (A) | CCS1174 |
| VR | 452 | Volume 10kΩ (C) | CCS1175 |
| VR | 453 | Volume 50kΩ (C) | CCS1176 |

RESISTORS

| Mark | Circuit Symbol & No. | Part No. |
|---|---|---|
| R | 1 2 12 | RS1/10S0R0J |
| R | 5 6 9 10 11 13 14 15 17 | RS1/8S0R0J |
| R | 451 452 | RS1/10S271J |
| R | 453 454 461 462 | RS1/10S473J |
| R | 455 456 | RS1/10S822J |
| R | 457 458 | RS1/10S472J |
| R | 459 460 | RS1/8S102J |
| R | 463 464 | RS1/10S432J |
| R | 465 466 | RS1/10S182J |
| R | 467 468 471 | RS1/10S221J |
| R | 469 | RS1/10S822J |
| R | 470 | RS1/8S822J |
| R | 472 | RS1/8S221J |
| R | 473 474 | RS1/10S222J |

CAPACITORS

| Mark | Circuit Symbol & No. | Part No. |
|---|---|---|
| C | 451 452 453 454 | CCSQSL330J50 |
| C | 455 456 | CESAS4R7M35 |
| C | 457 458 | CKSYF224Z25 |
| C | 459 | CESAS470M10 |
| C | 460 | CESAS101M10 |
| C | 461 462 | CKSYB473K25 |

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| IC | 551 851 | | UPC4570HA |
| IC | 651 | | TA8194Z |
| IC | 901 | | UPC494C |
| Q | 551 552 | | 2SA1145 |
| Q | 553 554 | | 2SC2705 |
| Q | 555 556 | | 2SC3421 |
| Q | 557 558 | | 2SA1358 |
| Q | 559 560 | | 2SD1707 |
| Q | 561 562 | | 2SB1156 |
| Q | 563 564 | | 2SC1568 |
| Q | 655 660 663 851 852 910 911 | | 2SA1048 |
| Q | 656 657 661 912 913 | | 2SC2458 |
| Q | 662 | | 2SC3113 |
| Q | 664 665 | | 2SD1768S |
| Q | 901 902 903 904 | | 2SK1191 |
| Q | 905 907 | | 2SA1359 |
| Q | 906 908 | | 2SC3422 |
| Q | 914 916 | | 2SB1243 |
| Q | 915 917 | | 2SD1864 |
| D | 657 913 | | ERA15-02 |
| D | 658 905 906 | | ERA15-02VH |
| D | 659 | | RD6R8JSB2 |
| D | 660 910 | | RD9R1JSB2 |
| D | 661 662 663 902 903 | | 1SS133 |
| D | 901 | | RM4Z |
| D | 904 | | RBV-602L |
| D | 907 908 | | RD16JSB1 |
| D | 909 | | 1SS133 |
| D | 911 | | RD6R2JSB3 |
| L | 551 552 | Coil | CTH1028 |
| L | 901 | Choke Coil | CTH1049 |
| L | 903 904 | Choke Coil | CTH1027 |
| L | 905 906 | | CCG-081 |
| L | 907 | Coil 100μH | CTF-113 |
| T | 901 | Transformer | CTT1011 |
| RY | 651 | Relay | CSR-040 |
| SW | 901 | Switch | HSH-156 |
| VR | 551 552 | Semi-fixed 1.5kΩ (B) | VRTB6VS152 |

RESISTORS

| Mark | Circuit Symbol & No. | Part No. |
|---|---|---|
| R | 551 552 555 678 859 860 | RD1/4PS471JL |
| R | 553 554 662 663 863 864 | RD1/4PS103JL |
| R | 557 558 | RD1/4PS363JL |
| R | 559 560 561 562 925 926 | RD1/4PS153JL |
| R | 563 564 565 566 861 862 | RD1/4PS681JL |
| R | 567 568 569 570 579 580 581 582 671 672 | RD1/4PS473JL |
| R | 571 572 573 574 | RD1/4PS161JL |
| R | 575 576 | RD1/4PS472JL |
| R | 577 578 677 851 852 | RD1/4PS222JL |
| R | 583 931 | RD1/4PS221JL |

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| R | 584 | | RD1/4PS221JL |
| R | 585 586 588 | | RD1/4PS100JL |
| R | 587 | | RD1/4PS100JL |
| R | 589 590 591 592 593 594 595 596 | 0.22Ω/2W | CCM1013 |
| R | 597 598 599 600 | | RS1/2P100JL |
| R | 657 658 659 943 | | RD1/4PS223JL |
| R | 664 | | RD1/4PS123JL |
| R | 665 | | RD1/4PS331JL |
| R | 666 | Thermister | CCX1009 |
| R | 667 | | RD1/4PS822JL |
| R | 668 669 907 908 915 916 917 938 939 | | RD1/4PS472JL |
| R | 670 853 854 | | RD1/4PS104JL |
| R | 673 674 | | RD1/4PS393JL |
| R | 675 676 | | RD1/4PS564JL |
| R | 855 856 | | RD1/4PS274JL |
| R | 857 858 | | RD1/4PS471JL |
| R | 901 902 | | RD1/2PS220JL |
| R | 903 904 905 906 | | RD1/4PM820J |
| R | 909 910 | | RD1/4PS332JL |
| R | 911 942 | | RD1/4PS102JL |
| R | 912 | | RD1/4PS682JL |
| R | 913 | | RD1/4PS472JL |
| R | 918 | | RD1/4PS184JL |
| R | 919 | | RD1/4PS183JL |
| R | 920 | | RD1/4PS102JL |
| R | 921 | | RD1/4PS105JL |
| R | 922 | | RN1/4PC1502D |
| R | 923 924 | | RD1/4PS182JL |
| R | 928 929 | | RD1/4PM100J |
| R | 930 | | RD1/4PS152JL |
| R | 937 | | RD1/4PS104JL |
| R | 940 941 | | RD1/4PS122JL |
| R | 944 | | RD1/4PS473JL |

CAPACITORS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| C | 551 | | CEZA101M10 |
| C | 553 554 | | CCPSL470J50L |
| C | 555 556 557 558 | | CCPSL330J50L |
| C | 559 560 561 562 | | CCPSL220J50L |
| C | 563 564 565 566 | | CQFAH224J50L |
| C | 567 568 | | CQFAH223J50L |
| C | 569 570 571 572 | | CQFA333J50L |
| C | 575 576 | 2200μF/35V | CCH1024 |
| C | 577 578 | | CKCYB102K50 |
| C | 579 580 913 914 | | CEA470M16L2 |
| C | 581 582 | | CEA471M35L2 |
| C | 652 905 | | CEA101M16L2 |
| C | 653 | | CEA220M16L2 |
| C | 654 | | CEA4R7M35L2 |
| C | 656 | 220μF/10V | CCH1036 |
| C | 657 | 470μF/16V | CCH-114 |
| C | 851 852 | | CEZA2R2M50 |
| C | 853 | | CEA471M6R3L2 |
| C | 854 | | CKPYB102K50L |
| C | 855 856 857 858 | | CEZA470M10 |
| C | 901 902 | 3900μF/16V | CCH1025 |
| C | 903 904 | | CQMA223J50 |
| C | 906 | | CEA471M10L2 |
| C | 907 | | CEA2R2M50L2 |
| C | 908 | | CQPA102J2A |
| C | 909 910 | 3900μF/35V | CCH1088 |
| C | 911 | | CEA102M16L2 |
| C | 916 | | CEA101M10L2 |
| C | 917 | | CEA331M6R3L2 |
| C | 918 920 921 | | CKCYF473Z50 |

Miscellaneous Parts List

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| FU | 10 | Fuse 30A | CEK1140 |

## ● GM-H50/UC

Unit Number :
Unit Name : Volume Unit

MISCELLANEOUS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| IC | 451 452 | | UPC4570HA |
| Q | 451 452 | | 2SC2458 |
| D | 912 | | PR3432S |
| VR | 451 | Volume 10kΩ (A) | CCS1174 |
| VR | 452 | Volume 10kΩ (C) | CCS1175 |
| VR | 453 | Volume 50kΩ (C) | CCS1176 |

RESISTORS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| R | 1 2 12 | | RS1/10S0R0J |
| R | 5 6 9 10 11 13 14 15 17 | | RS1/8S0R0J |
| R | 451 452 | | RS1/10S271J |
| R | 453 454 461 462 | | RS1/10S473J |
| R | 455 456 | | RS1/10S473J |
| R | 457 458 | | RS1/10S472J |
| R | 459 460 | | RS1/8S102J |
| R | 463 464 | | RS1/10S432J |
| R | 465 466 | | RS1/10S182J |
| R | 467 468 471 | | RS1/10S221J |
| R | 469 | | RS1/10S822J |
| R | 470 | | RS1/8S822J |
| R | 472 | | RS1/8S221J |
| R | 473 474 | | RS1/10S222J |

CAPACITORS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| C | 451 452 453 454 | | CCSQS330J50 |
| C | 455 456 | | CESAS7M35 |
| C | 457 458 | | CKSYF224Z25 |
| C | 459 | | CESAS0M10 |
| C | 460 | | CESAS1M10 |
| C | 461 462 | | CKSYB473K25 |

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| IC | 551 851 | | UPC4510HA |
| IC | 651 | | TA8191Z |
| IC | 901 | | UPC494C |
| Q | 551 552 | | 2SA1115 |
| Q | 553 554 | | 2SC2715 |

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| Q | 555 556 | | 2SC3421 |
| Q | 557 558 | | 2SA1358 |
| Q | 559 560 | | 2SD1705 |
| Q | 561 562 | | 2SB1154 |
| Q | 563 564 | | 2SC1568 |
| Q | 655 660 663 851 852 910 911 | | 2SA1048 |
| Q | 656 657 661 912 913 | | 2SC2458 |
| Q | 662 | | 2SC3113 |
| Q | 664 665 | | 2SD1768S |
| Q | 901 902 | | 2SK1191 |
| Q | 905 907 | | 2SA1359 |
| Q | 906 908 | | 2SC3422 |
| Q | 914 916 | | 2SB1243 |
| Q | 915 917 | | 2SD1864 |
| D | 657 | | ERA15-02 |
| D | 658 905 906 | | ERA15-02VH |
| D | 659 | | RD6R8JSB2 |
| D | 660 910 | | RD9R1JSB2 |
| D | 661 662 663 902 903 | | 1SS133 |
| D | 901 | | RM4Z |
| D | 904 | | RBV-602L |
| D | 907 908 | | RD16JSB1 |
| D | 909 | | 1SS133 |
| D | 911 | | RD6R2JSB3 |
| L | 551 552 | Coil | CTH1028 |
| L | 901 | Choke Coil | CTH1031 |
| L | 903 904 | Choke Coil | CTH1036 |
| L | 905 906 | | CCG-081 |
| L | 907 | Coil 100μH | CTF-113 |
| T | 901 | Transformer | CTT1012 |
| RY | 651 | Relay | CSR1010 |
| SW | 901 | Switch | HSH-156 |
| VR | 551 552 | Semi-fixed 1.5kΩ (B) | VRTB6VS152 |

RESISTORS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| R | 551 552 555 678 859 860 | | RD1/4PS471JL |
| R | 553 554 662 663 863 864 | | RD1/4PS103JL |
| R | 557 558 | | RD1/4PS363JL |
| R | 559 560 561 562 925 926 | | RD1/4PS153JL |
| R | 563 564 565 566 861 862 | | RD1/4PS681JL |
| R | 567 568 569 570 579 580 581 582 671 672 | | RD1/4PS473JL |
| R | 571 572 573 574 | | RD1/4PS161JL |
| R | 575 576 | | RD1/4PS562JL |
| R | 577 578 677 851 852 | | RD1/4PS222JL |
| R | 583 931 | | RD1/4PS221JL |
| R | 584 | | RD1/4PS221JL |
| R | 585 586 588 | | RD1/4PS100JL |
| R | 587 | | RD1/4PS100JL |
| R | 589 590 591 592 593 594 595 596 | 0.22Ω/2W | CCN1013 |
| R | 597 598 599 600 | | RS1/2P100JL |
| R | 657 658 659 943 | | RD1/4PS223JL |
| R | 664 | | RD1/4PS123JL |
| R | 665 | | RD1/4PS331JL |
| R | 666 | Thermister | CCX1010 |
| R | 667 | | RD1/4PS822JL |
| R | 668 669 907 908 915 916 917 938 939 | | RD1/4PS472JL |
| R | 670 853 854 | | RD1/4PS104JL |
| R | 673 674 | | RD1/4PS393JL |
| R | 675 676 | | RD1/4PS564JL |
| R | 855 856 | | RD1/4PS274JL |
| R | 857 858 | | RD1/4PS471JL |
| R | 901 902 | | RD1/2PS220JL |
| R | 903 904 | | RD1/4PM820J |
| R | 909 910 | | RD1/4PS332JL |
| R | 911 942 | | RD1/4PS102JL |
| R | 912 | | RD1/4PS682JL |
| R | 913 | | RD1/4PS562JL |
| R | 918 | | RD1/4PS683JL |
| R | 919 | | RD1/4PS183JL |
| R | 920 | | RD1/4PS102JL |
| R | 921 | | RD1/4PS105JL |
| R | 922 | | RN1/4PC1502D |
| R | 923 924 | | RD1/4PS182JL |
| R | 928 929 | | RD1/4PM100J |
| R | 930 | | RD1/4PS152JL |
| R | 936 | | RD1/4PS683JL |
| R | 937 | | RD1/4PS104JL |
| R | 940 941 | | RD1/4PS122JL |

CAPACITORS

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| C | 551 | | CEZA101M10 |
| C | 553 554 | | CCPSL470J50L |
| C | 555 556 557 558 | | CCPSL330J50L |
| C | 559 560 561 562 | | CCPSL220J50L |
| C | 563 564 565 566 | | CQFAH224J50L |
| C | 567 568 | | CQFAH223J50L |
| C | 569 570 571 572 | | CQFA333J50L |
| C | 575 576 | 2200μF/35V | CCH1024 |
| C | 577 578 | | CKCYB102K50 |
| C | 579 580 913 914 | | CEA470M16L2 |
| C | 581 582 | | CEA471M35L2 |
| C | 652 905 | | CEA101M16L2 |
| C | 653 | | CEA220M16L2 |
| C | 654 | | CEA4R7M35L2 |
| C | 656 | 220μF/10V | CCH1036 |
| C | 657 | 470μF/16V | CCH-114 |
| C | 851 852 | | CEZA2R2M50 |
| C | 853 | | CEA471M6R3L2 |
| C | 854 | | CKPYB102K50L |
| C | 855 856 857 858 | | CEZA470M10 |
| C | 901 902 | 3300μF/16V | CCH1023 |
| C | 903 904 | | CQMA223J50 |
| C | 906 | | CEA471M10L2 |
| C | 907 | | CEA2R2M50L2 |
| C | 908 | | CQPA102J2A |
| C | 909 910 | 3300μF/25V | CCH1087 |
| C | 911 | | CEA102M16L2 |
| C | 916 | | CEA101M10L2 |
| C | 917 | | CEA331M6R3L2 |
| C | 918 920 921 | | CKCYF473Z50 |

Miscellaneous Parts List

| Mark | Circuit Symbol & No. | Part Name | Part No. |
|---|---|---|---|
| FU | 10 | Fuse 15A | CEK1137 |

# 11. CONNECTING THE UNITS

Connect the components as shown in the diagram.

- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

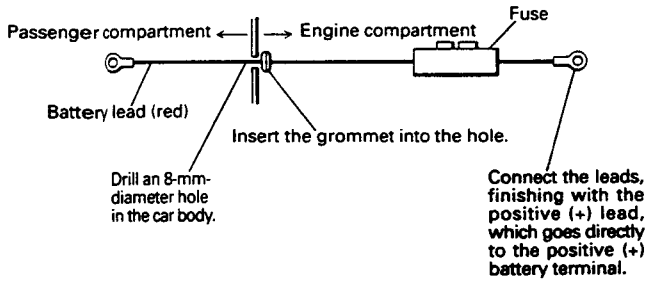
| Mode | | Speaker ratings | |
|---|---|---|---|
| | | GM-H100 | GM-H50 |
| Two-channel | Maximum | 100 W | 50 W |
| | Nominal | 50 W | 25 W |
| One-channel | Maximum | 320 W | 160 W |
| | Nominal | 160 W | 80 W |

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the power leads to the amplifier away from the signal cords (RCA cords) and speaker leads. Also, keep the power leads away from any antenna cords.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the battery lead and the accessory power lead (red) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.

## Connecting the battery lead (red)

**Route the battery lead (red) from the engine compartment to the passenger compartment to connect it to the amplifier. To prevent a short circuit, do not connect the positive (+) lead of the battery until the other leads have been connected.**


Passenger compartment
Engine compartment
Fuse
Battery lead (red)
Insert the grommet into the hole.
Drill an 8-mm-diameter hole in the car body.
Connect the leads, finishing with the positive (+) lead, which goes directly to the positive (+) battery terminal.

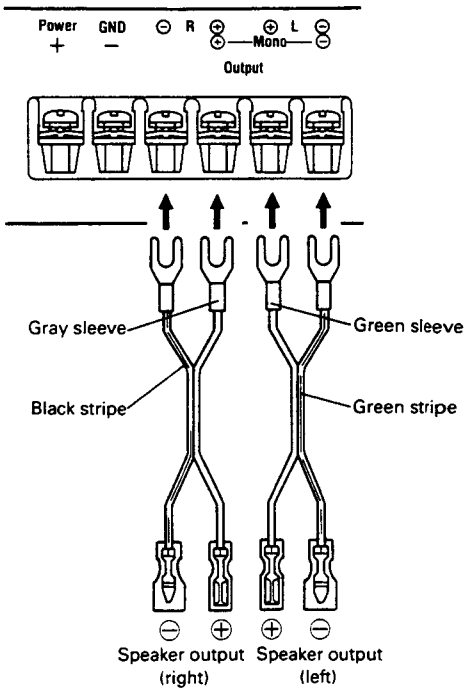
## Connecting the leads (supplied)

### Connecting the speaker leads

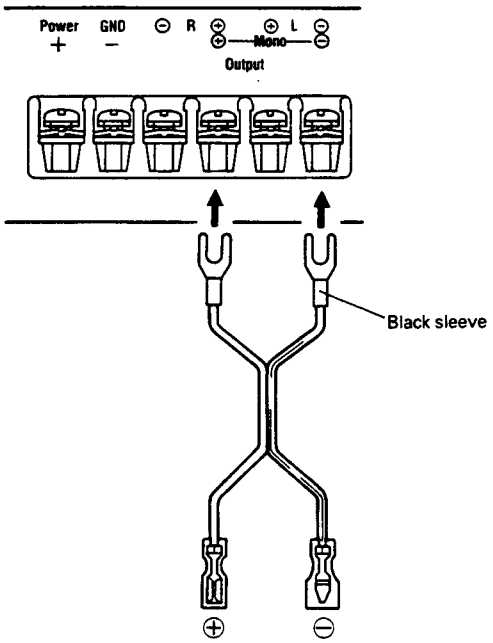
The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). Connect the speaker leads to suit the mode. To connect the speaker leads to the speaker terminals of the amplifier, see the connection diagram for each channel. Be careful with the polarity (+ and –), and with which channel is which (left [L] and right [R]).

- If the amplifier is used in three-channel mode, inductors and capacitors are needed. For more information, see "Three-channel mode (stereo + mono)".

### Two-channel mode (stereo)




### One-channel mode (mono)

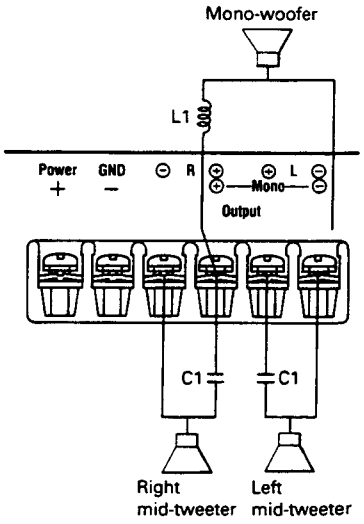



### Three-channel mode (stereo + mono)

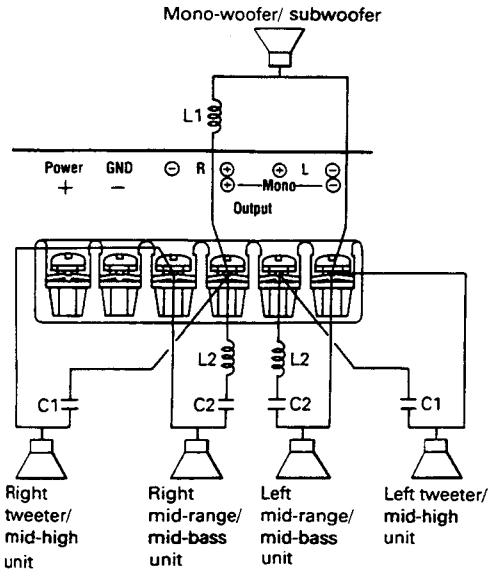
The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be catered for by combining the stereo and mono modes using inductors and capacitors. Some typical examples are given below.

- As making this connection does require a knowledge of electronics, get it done by your dealer or by someone specializing in such work.

**Example 1 Three-channel, two-way system**



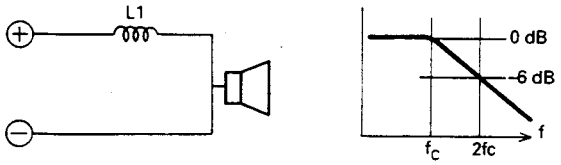
**Example 2 Three-channel, three-way system**



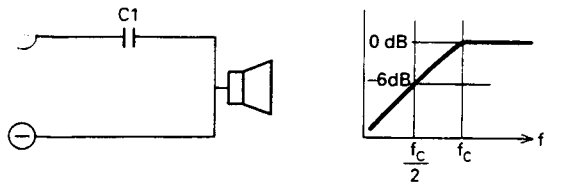

- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter. In three-channel mode, connect the inductor (L) to the woofer / subwoofer, and the capacitor (C) to the mid-tweeter / tweeter / mid-high unit.
  The filters (low-pass and high-pass) must be used in three-channel mode, otherwise the total load will be 2Ω or less, and the amplifier may fail, even if the speaker impedance is 4Ω.
- If the inductors and capacitors are connected to the speaker leads, secure or solder them so they cannot be pulled loose. Tape the joints to prevent short circuits.

## Setting the filter constant

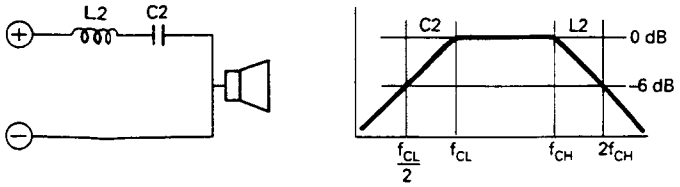
**① Low-pass filter (for subwoofer/woofer): 6 dB/octave**




**② High-pass filter (for mid-tweeter/mid-high-tweeter): 6 dB/octave**




**③ Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave**



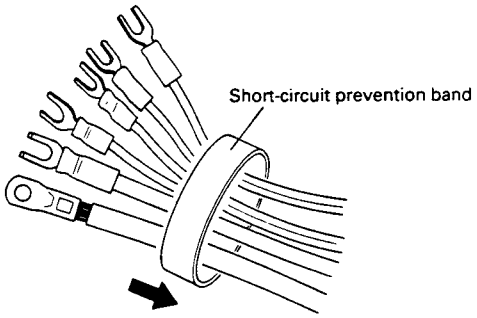

### Component Guide

| Speaker load impedance | 2Ω | | 4Ω | | 8Ω | |
|---|---|---|---|---|---|---|
| fc (Hz) | L (mH) | C (μF) | L (mH) | C (μF) | L (mH) | C (μF) |
| 50 | 6.4 | 1600 | 12.7 | 800 | 25.5 | 400 |
| 80 | 4.0 | 1000 | 8.0 | 500 | 16 | 250 |
| 125 | 2.5 | 560 | 5.1 | 300 | 10 | 160 |
| 200 | 1.6 | 400 | 3.2 | 200 | 6.4 | 100 |
| 320 | 1.0 | 250 | 2.0 | 125 | 4 | 62 |
| 500 | 0.64 | 160 | 1.3 | 80 | 2.6 | 40 |
| 800 | 0.4 | 100 | 0.8 | 50 | 1.6 | 25 |
| 1250 | 0.25 | 64 | 0.5 | 30 | 1.0 | 16 |
| 2000 | 0.16 | 40 | 0.3 | 20 | 0.64 | 10 |
| 3200 | 0.1 | 25 | 0.2 | 12.5 | 0.4 | 6.2 |
| 5000 | 0.06 | 16 | 0.13 | 8 | 0.26 | 4 |
| 8000 | 0.04 | 10 | 0.08 | 5 | 0.16 | 2.5 |
| 10000 | 0.03 | 8 | 0.06 | 4 | 0.13 | 2 |

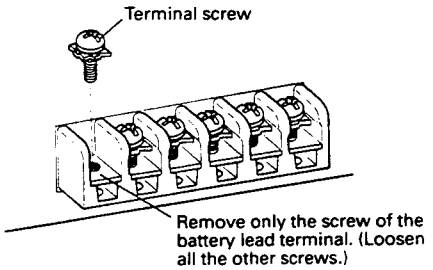
- A multi-channel system can be set up using a combination of filters ①, ②, and ③. The inductance (L) and capacitance (C) that determine the frequency (fc) applicable to the system should be chosen according to the above table .
- Use the capacitors specified. Non-polarized capacitors rated at over ±25V should be used for C1 and C2 in the diagram.

## Connection procedure for speaker, battery, and ground leads

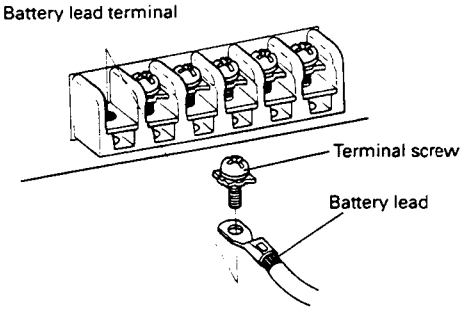
1. Pass the leads through the band for preventing short circuits.
   - This band *must* be used.



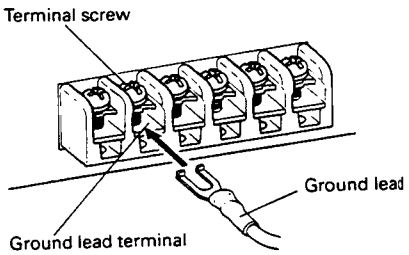

2. Loosen the screws of the terminals on the rear panel, and remove the screw of the battery lead terminal.



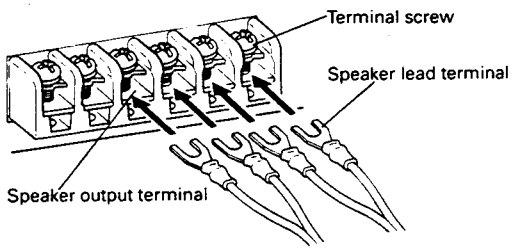

3. Connect the battery lead to the battery lead terminal, reinserting and tightening the screw.



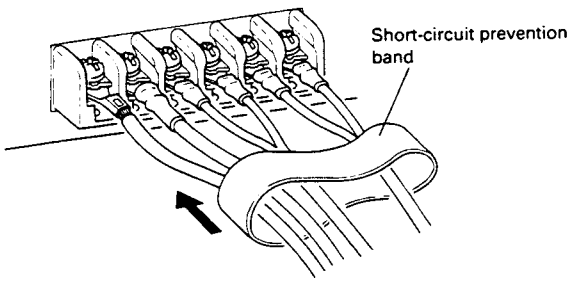

4. Connect the ground lead to the ground lead terminal, tightening the screw.

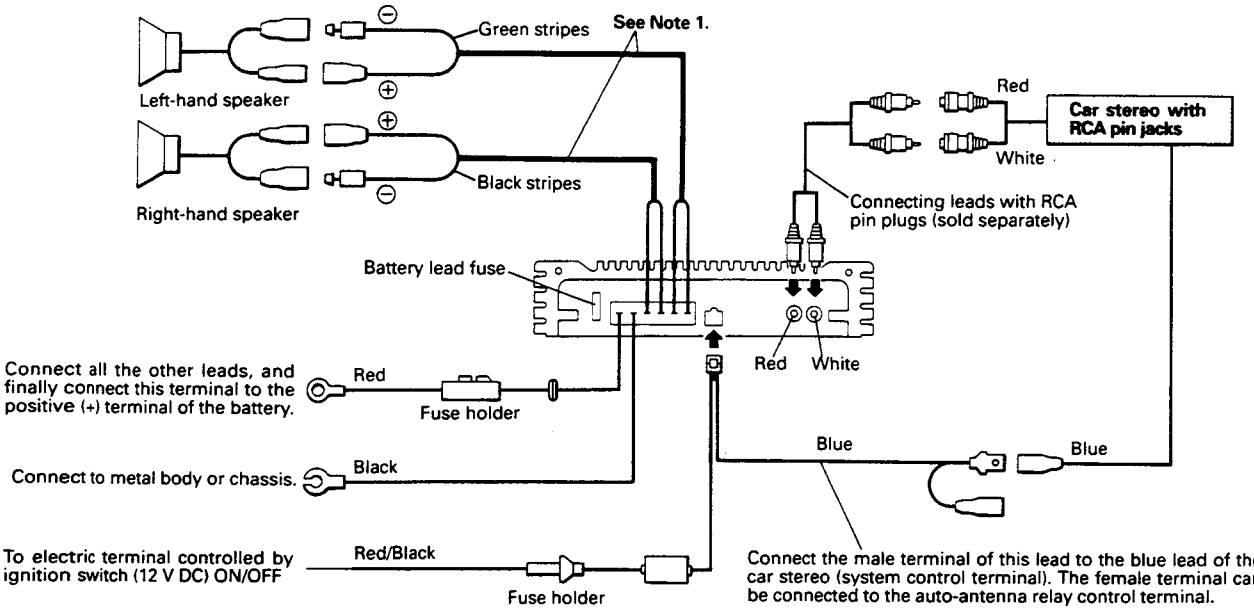



5. Arrange the speaker leads to suit the output mode to be used, connecting them to the speaker output terminals, and tightening the screws.



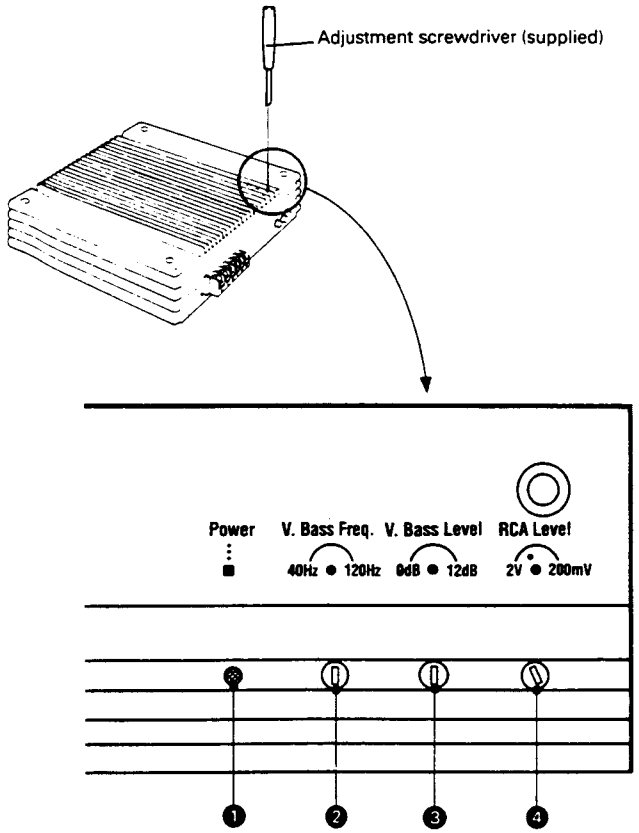

6. Slide the short-circuit prevention band over the terminals.




Green stripes
See Note 1.
Left-hand speaker
Black stripes
Right-hand speaker
Red
White
Car stereo with RCA pin jacks
Connecting leads with RCA pin plugs (sold separately)
Battery lead fuse
Red
White
Connect all the other leads, and finally connect this terminal to the positive (+) terminal of the battery.
Red
Fuse holder
Blue
Blue
Connect to metal body or chassis.
Black
To electric terminal controlled by ignition switch (12 V DC) ON/OFF
Red/Black
Fuse holder
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.

**Note 1:**
The speaker leads are connected differently depending on whether the output mode is three-channel, two-channel, or one-channel. This connection diagram shows how to wire up the amplifier for two-channel mode.

# 12. CONTROLS AND THEIR USE




### ❶ Power Indicator
The power indicator lights when the power is switched on.

### ❷ Variable Bass Frequency Control
Adjusting the variable bass frequency control changes the boostable bass frequency of the amplifier. You can select a frequency in the range 40 to 120 Hz. Adjust the boostable bass frequency to suit the speakers or the music.

### ❸ Variable Bass Level Control
Adjusting the variable bass level control changes the level of the boostable bass frequency set by control ❷.

- If you do not want to boost the bass, turn the control fully counterclockwise to 0 dB.

### ❹ RCA Input Level Control
If the output is low even when the volume of the car stereo is turned up, turn this control clockwise. If there is distortion when the volume of the car stereo is turned up, turn this control counterclockwise.

- Adjust controls ❷, ❸, and ❹ with the supplied adjustment screwdriver. Keep the screwdriver in case you need to readjust the controls later.
- No change in low-frequency sounds may be noticeable when the 40-to-120-Hz frequency level is adjusted if the program source does not contain components in the 40-to-120-Hz range or if small-diameter speakers are used.

### BFC (Beat Frequency Control) switch
If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.